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MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY  
UNITED STATES DEPARTMENT OF AGRICULTURE

Number 157

May, 1927

BUSINESS ADMINISTRATION

Attention is called to P. B. A. Circular No. 75, which will be issued in The Official Record and deals with the use of extra fare trains. It is important that when extra fare trains are used employees should follow carefully the Travel Regulations and obtain advance authorization or give specific explanation on the voucher as to the necessity for the extra fare travel. Employees desiring a copy of this P. B. A. Circular will request it from their division chief, asking for Circular No. 75.

CEREAL AND FORAGE INSECT INVESTIGATIONS

W. H. Larrimer, Senior Entomologist, in Charge

A. F. Satterthwait, in charge of the Webster Groves, Mo., laboratory, spent a considerable portion of the month in making a determination of southern limits of the Hessian fly infestation and in conducting field work with reference to billbugs.

T. E. Holloway, in charge of the New Orleans, La., laboratory, spent May 13 in Washington in consultation with Bureau officials.

Dr. W. H. Larrimer spent May 20 to May 31, inclusive, conducting a survey of the corn borer cleanup operations.

J. W. Ingram recently conferred with Prof. R. W. Harned at the A. and M. College, Mississippi, on the danger from cutworms after the floods in the Mississippi valley.

Delos L. Van Dine, Jr., has been appointed Field Assistant with headquarters at Jaronu, Cuba. He will cooperate with H. K. Plank, of the Tropical Plant Research Foundation, in sending parasites of sugar cane insects to Louisiana and Florida. In Louisiana the parasites will be received by the Sugar Cane Insect Laboratory, and in Florida the work will be carried on in cooperation with the Florida Experiment Station and with a station of the Bureau of Plant Industry.

Charles A. Clark, Junior Entomologist, has accepted an appointment at the Arlington, Mass., laboratory.

Earl G. Davis, Junior Entomologist, has accepted an appointment at the Tempe, Ariz., laboratory.

Ralph A. Blanchard has accepted a transfer from the Monroe, Mich., Corn Borer Laboratory to the Tempe, Ariz., laboratory.

Capt. Howard C. French has been appointed agent, effective May 24, for duty at Salt Lake City, Utah.

COTTON INSECT INVESTIGATIONS

INVESTIGATIONS OF INSECTS AFFECTING THE HEALTH OF MAN AND DOMESTIC ANIMALS

J. L. Webb, Associate Entomologist, Acting in Charge

In a letter dated May 30, B. R. Coad writes from Tallulah, La., as follows:

"Quite a little of this country is beginning to come out of the overflow now and, of course, in our own work, we are very busy salvaging things and getting organized. Evidently our air field will be under water for a long time yet, probably something over a month, but the water has fallen enough so that we are able to start moving out our dusting machinery and similar articles, and we are moving this into town as fast as we can. All electrical equipment is, of course, ruined but the remainder of the machinery has not rusted much, and by cleaning and greasing this as fast as it is taken out of the water we hope to be able to salvage most of it. Delicate parts will also be ruined, but these can be replaced at comparatively little cost. I have made one trip above Tallulah and another one to the south of here, covering the areas which were not overflowed, owing to protection from small private levees, and think that between the two territories we can soon get started on our most important research work, where it is essential to have fields where there was no overflow water. This is particularly true in the case of the hopper. Judging from present prospects, we will probably locate a temporary insectary about Alsatia or Transylvania, and move some of our equipment up there for starting the earliest biological work. We have one deep stretch of water between here and there which will probably last until well into the summer, but can cross this by boat, and I have secured the use of a motor car and a couple of flats which we use on the railroad to go from the edge of the water to our place of work. All experiments south of Tallulah will have to be reached by boat for a long time, as the highway there is under 10 feet of water in some places yet."

"With reference to high-water insects, every preparation is being made to meet an outbreak of cutworms, grass worms, leaf worms, and then an invasion of boll weevils in August. The old theory was that immature stages of cutworms in the ground were not injured by overflow, whereas their natural enemies were largely destroyed. Then when the water subsided, these worms came out with a large appetite and found very little vegetation except for the small amount of sprouted seed which had been planted since the overflow. Personally this theory never seemed to quite completely cover the situation, I can not believe that it would account for the enormous number of worms which appear in the first generation within a week to two weeks after the water subsides. It seems to me that an increase due to destroying the balance between host and parasite should require at least a generation to produce such a marked effect. Doctor Folsom is trying to get something definite on this subject this season."

JAPANESE BEETLE INVESTIGATIONS

Loren B. Smith, Entomologist, in Charge

H. C. Hallock has been transferred from the Japanese Beetle Laboratory to a new substation at Westbury, Long Island, for the purpose of conducting biological work on Anomala orientalis.

Dr. C. H. Kennedy, of Ohio State University, visited the Laboratory in the last week in May. Dr. Kennedy has been arranging for the transfer of the Wentzel collection of Coleoptera from Philadelphia to Columbus, Ohio.

J. K. Holloway and M. C. Swingle, of Columbus, Ohio, E. T. Lundberg, of Storrs, Conn., and R. W. Burrell, of Amherst, Mass., have recently joined the parasite project of the Japanese Beetle Laboratory. Messrs. Holloway and Swingle, who have been doing graduate work at Ohio State University during the past year, have been at the Japanese Beetle Laboratory for several weeks. Mr. Lundberg, who graduates at Connecticut Agricultural College this year, and Mr. Burrell, who graduates at Massachusetts Agricultural College, will report for duty early in June.

J. L. King and H. W. Allen recently visited the Gipsy Moth Laboratory at Melrose Highlands, and the Corn Borer Laboratory at Arlington, Mass. While there they made a profitable study of the methods used in parasite work at these institutions. Dr. Allen spent a few hours examining type material of North American Tiphia in the collections of the Cambridge Museum of Cooperative Zoology, as well as in the Connecticut State collection at New Haven.

T. R. Gardner, who left Riverton early in May, has arrived at his station in Yokohama, Japan. He will continue collecting Popillia parasites in Japan, in Chosen, and, so far as conditions permit, in China.

Dr. B. A. Porter, of Vincennes, Ind., visited the Laboratory on May 26 and conferred with E. R. Van Leeuwen relative to codling moth investigations.

Max R. Osburn, who recently completed his work at Ohio State University for the degree of Master of Science, has been appointed Field Assistant of the Bureau and assigned to beetle insecticide studies at Riverton, N. J. Mr. Osburn was formerly affiliated with the Ohio State Agricultural Experiment Station, at Wooster.

E. R. Van Leeuwen recently conferred with the citizens of Langhorne, Pa., who are interested in the protection of their garden plants and shrubs from attacks of the Japanese beetle. Possible control measures were discussed.

L. B. Smith recently attended a meeting of the Executive Committee of the Eastern Plant Board in New York City, relative to quarantine matters.

A quarantine office has been opened at No. 2000 Bronx Street, West Farms, New York City.

## FOREST INSECT INVESTIGATIONS

F. C. Craighead, Senior Entomologist, in Charge

In the early part of May Dr. Craighead spent a few days at the forest insect field laboratory at Amherst, Mass., to discuss plans for the coming year of studies of the white pine weevil. Dr. J. M. Swaine, of the Dominion Entomological Branch, Canada, S. T. Dana, Director of the Northeastern Forest Experiment Station, Amherst, Mass., and H. J. MacAloney, in charge of the Bureau's field laboratory at Amherst, were present at the conferences.

In the latter half of May Dr. Craighead spent a few days at Asheville, N. C., looking over the field experiments there on the southern pine beetle. R. A. St. George, J. A. Beal, and the summer assistant, R. E. Balch, will be stationed at Asheville for the season. Up to the present no living specimens of the southern pine beetle have been obtained this season. There seems to be an almost complete mortality of the overwintering broods, as a result of the low temperatures of the past winter.

On May 12 L. G. Baumhofer, stationed at Halsey, Nebr., arrived in Asheville to study the tip moth situation about there, with a view to obtaining new parasites to introduce in the plantations at Halsey. Later, accompanied by Mr. St. George, he left Asheville for Bogalusa, La., where the tip moth has been causing severe losses for the past few years to the reproduction of young pine. Loblolly pines were found to be the favorite host, while slash pine was but slightly injured. Observations seemed to indicate that longleaf pine was almost immune from this type of injury, its principal injury seeming to be a loss in the attainment of height. Observations were also made on a series of trap-tree studies that have been in progress for the last two years, to determine the aggressiveness of certain barkbeetles and the conditions most favorable for their attack and the development of their broods.

On May 20 Messrs. Baumhofer and St. George conferred with R. D. Forbes, Director of the Southern Forest Experiment Station, New Orleans, La., on current insect problems in the South. It was learned that tip moth injury has been noted in plantations all over the northern part of Louisiana, especially for the past two or three years, indicating that this injury is quite general in the State.

C. N. Bilbray, of the Louisiana Department of Conservation, stationed at Many, La., reported an extensive outbreak of sawfly larvae on shortleaf pine this year. The larvae appeared in Sabine and Vernon Parishes about April 28, attacking more than 36,000 acres of young growth from 3 to 5 feet high. It was stated that the full-grown larvae are plentiful at this time, and suggestions were made for their control. These larvae were first reported as defoliating pines in June, 1926. Mr. Bilbray also reported the browning of foliage of apparently thrifty young longleaf pine trees by lepidopterous needle miners, extending over the same areas in these two parishes.

On May 23 J. A. Beal gave a short radio talk on forest insects. It was broadcast from Station WWNC, Asheville, N. C., under the auspices of the Southern Appalachian Section, Society of American Foresters.

On May 3 Dr. Snyder represented the Bureau of Entomology on the National Commission of Wood Utilization, at its second annual meeting, at Washington, D. C., presided over by Secretary Hoover, of the U. S. Department of Commerce. The Construction Subcommittee is to prepare a manual on "The Economics of Wood Utilization in Construction," which will include standardized specifications and preservative treatments to prevent insect attack. The Wood Preservatives Subcommittee has arranged to have always available a continuous supply of lumber, preserved by standard chemicals and according to methods approved by the American Wood Preservers' Association. The first area will be the territory included in a circle of 50 miles radius about St. Louis, Mo., as a center. Both of these programs will materially aid the Bureau of Entomology in its efforts to have standardized building codes to prevent damage by insects, and especially the plan of having preserved wood available for the retail trade at different centers.

Recently Dr. Stephen A. Forbes, Chief of the State Natural History Survey, Urbana, Ill., and Dr. E. Kanekira, Government Institute of Science, Formosa, Japan, consulted with Dr. Snyder on termite control.

On May 8 William Middleton and T. E. Snyder inspected coniferous timbers recently removed from the roof of the White House. The roof has been so greatly weakened that it had to be replaced. It was found that the timbers of the roof had been powderposted by a cossonid, Hexarthrum ulkei Horn. This insect has caused similar injury to buildings in New York and Washington, and has also damaged flooring in houses in Washington.

Some of the specimen box bushes bordering the drive on the north side of the White House have been very heavily infested by the boxwood leaf miner, and Mr. Middleton, of this office, has been active in making recommendations and offering advice to Mr. Reeves, of the White House, in combating the insect.

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#### DECIDUOUS-FRUIT INSECT INVESTIGATIONS

A. L. Quaintance, Associate Chief of Bureau, in Charge

Harold H. Shepard, a graduate of the Massachusetts Agricultural College, has been appointed Assistant Entomologist and assigned to duty at Washington, D. C., where he will be associated with Dr. C. H. Richardson in insecticide investigations.

Dr. N. E. McIndoo, who has been engaged in insecticide studies, with headquarters at Washington, D. C., has been transferred to the field service, with headquarters at the Sligo, Md., laboratory.

Oliver I. Snapp, in charge of the peach insect laboratory at Fort Valley, Ga., writes that the first adult curculios there emerged from the soil on May 24, which is the earliest first-emergence date in seven years. Two full broods are anticipated, and he is expecting second-brood larvae to infest the Hiley peaches this year. The Hiley is a mid-season variety.

### TRUCK-CROP INSECT INVESTIGATIONS

J. E. Graf, Senior Entomologist, in Charge

Through the cooperation of the University of California, the supervisors of Orange County, Calif., and the Bureau of Entomology, a substation of the Alhambra truck-crop laboratory has been established at Garden Grove for the purpose of studying the pepper weevil, and J. C. Elmore will be in charge of it during the summer. A. C. Davis, who recently received the degree of Master of Science from the University of California, has been appointed Research Assistant in the Department of Entomology of that university, and will be permanently located at the new substation. Pepper canners, shippers, and growers have raised a fund of \$1,000 to help defray the expenses of the substation. R. E. Barrett and John Steinweden have been appointed county inspectors to assist in pepper weevil control during the summer.

Recent visitors at the Alhambra station were C. C. Wilson, of the Sacramento laboratory of Cereal and Forage Insect Investigations, and Prof. W. B. Herms, Dr. E. C. Van Dyke, and Mr. John Lamiman, of the University of California.

C. E. Smith, in charge of the Baton Rouge laboratory, has reported that owing to the fact that this laboratory is situated on high ground none of the experiments in progress there have been affected by the Mississippi flood.

J. E. Dudley, Jr., in charge of the field station at Madison, Wis., recently opened his summer camp at Columbus. As was the case last year, the work there will be principally on the control of the pea aphid.

Rodney Cecil returned about May 1 to his temporary headquarters at Geneva, N. Y., where he will continue his experiments on the pea aphid and bean insects.

A. Weed, who recently completed graduate work at the University of Wisconsin, has been appointed agent of this Division, effective April 1, in co-operation with the Wisconsin Experiment Station, to assist in studies on the pea aphid and onion maggot.

S. E. Crumb and K. B. McKinney, of the Clarksville, Tenn., laboratory, moved late in May to their summer station at Lexington, Ky. Mr. Crumb and J. U. Gilmore, of the same laboratory, have been assigned to work at Appomattox, Va., during the summer.

J. H. Lindenberger, of the Consumers' Tobacco Company, Albuquerque, N. M., reports that in May a severe outbreak of the tobacco stalk weevil (Trichobaris mucorea) was noted on the company's tobacco plantings which are grown as a source of agricultural nicotine at Tempe, Ariz.

## STORED-PRODUCT INSECT INVESTIGATIONS

E. A. Back, Senior Entomologist, in Charge

On May 13 a delegation of dried fruit interests from New York were in conference with Walter G. Campbell, Director of Regulatory Work, on matters relating to insect infestation in dried figs.

On May 14, D. K. Grady, Secretary of the Dried Fruit Association of California, with headquarters at San Francisco, was a caller at the Bureau.

R. T. Cotton attended the fourteenth spring meeting of the American Society of Refrigerating Engineers, held at the Green Briar Hotel, White Sulphur Springs, W. Va., May 23 to 25, at which he read a paper entitled "Effect of Cold Storage upon Clothes Moths." The Society had this paper reprinted for distribution among its members, that the discussion might be more general.

At the request of the flax tow interests of the Northwest, a conference was held in Washington, May 25, at which were discussed ways and means for determining the susceptibility to insect attack of various vegetable fibers currently used as upholstering materials. Certain furniture interests will assemble infested furniture from different parts of the country and give the Bureau an opportunity to make careful examinations at the cost of the flax tow interests. Strange to say, the lowly tobacco beetle is turning trade away from the flax industry. This accounts for the flax industry's very laudable determination to get the real facts. Palm fiber from Africa, Spanish moss from the Gulf Coast, flax straw from the Northwest, sea moss from the Pacific Coast, curled hair from everywhere, and cotton, are all competing for the chance to make you comfortable when you sink into luxurious and expensive furniture.

The Reliable Insecticide Company, of Portland, Oreg., has an excellent new fumigating plant in which, during the May Convention of the State Coroners, held in that city, a demonstration of the usefulness of hydrocyanic-acid gas was staged for the benefit of coroners not acquainted with the effect of this gas upon insects and warm-blooded animals.

At the request of the American Association of Ice and Refrigeration a paper was prepared by E. A. Back for presentation at its May 6 meeting, held at the Willard Hotel, Washington. The Bureau had been requested to discuss the method of protecting furs and fabrics by tight storage and fumigation, as opposed to the more expensive method of depending upon cold-storage temperatures.

On May 23, J. C. Hamlin, of the dried fruit insect investigations, submitted a detailed report on the condition of figs taken May 10 to 11 from dried fruit warehouses at Fresno, Calif. This report indicated contamination by insects ranging from 29 per cent to 80 per cent of the fruits, with a total contamination due to insects and diseased conditions ranging from 34 per cent to 82 per cent. Of the fruits affected by insects it would appear that about 60, 20, 13, and 7 per cent, respectively, were infested by the Indian meal moth, the sawtoothed grain beetle, a Habrobracon parasite of *Plodia*, and the dried-fruit beetle. About 60 per cent of the dried-fruit beetle con-

tamination was confined to one sample. Many fruits containing no visible remains of insects were found contaminated by insect excrement. This is the Bureau's opportunity to aid the dried-fruit industry in reducing the percentage of infested figs to a total of ten per cent, the new insect tolerance established by the Bureau of Chemistry under the Pure Food Law.

Every entomologist should have the circular issued by the California Almond Growers Exchange of San Francisco, Calif. A fine vacuum fumigation plant has been installed under the direction of D. B. Mackie, Entomologist of the State Department of Agriculture, and Collaborator of this Bureau, on the roof of the Association's modern fireproof plant at Sacramento. Mr. Mackie is given credit for the preparation of this circular.

E. A. Back left Washington May 10 for a 10-day trip through Georgia and Florida. Candy and nut meat establishments in Atlanta and Columbus, Ga., were visited. Fumigating rooms were inspected at Tampa and Jacksonville, Fla. Several days were spent with S. E. McClendon, who is engaged in corn weevil work in southern Georgia.

Perez Simmons left Washington May 28 to undertake a special investigation of the dried-fruit beetle affecting figs in California. He is working under a special appropriation of \$2,000 made by the Dried Fruit Association of that State. In this work Subtropical and Stored -Product Insect Investigations are cooperating. G. W. Ellington will be in field charge of the Angoumois grain moth investigation during the absence of Mr. Simmons.

One firm manufacturing a nationally used product stated in May, through one of its representatives, that in 1923 it lost \$10,000 in returned insect-damaged goods sent out by one of its many plants. In 1924 it installed a fumigating room and treated all its outgoing product, with the result that no goods were returned because of insect attack. This is ancient history, yet vital news to men dealing in agricultural products.

Of special interest to southern farmers should be the results of the work of S. E. McClendon in and around Brunswick, Ga. On certain farms where several years ago corn weevils were so abundant that corn in the cribs was badly damaged by October and November of the year of harvest, and almost ruined by the following June, the corn is almost free of weevils at the time of writing, late in May. The intelligent application of common knowledge is a great thing. More farmers are learning this every day as a result of the Bureau's work.

Some more definite statements regarding losses sustained by California bean growers as the result of bean weevil investigations were received in May from A. O. Larson. One warehouseman, who had received 30,909 bags of beans, estimated that 50 per cent of the bags had been discounted 50 cents each, representing an actual loss to farmers of \$7,727. Another warehouseman, who had received 50,000 bags, estimated that 40 per cent of his receipts had been discounted 50 cents a bag, thus netting growers a loss of \$10,000. Mr. Larson talked with two farmers who grew 370 and 200 bags of beans, respectively, and each had sustained a loss of \$1 a bag as a result of weevil infestation. Such losses, more than anything else, are giving Messrs. Larson and Fisher attentive audiences.

In the latter part of April J. C. Hamlin, of the Dried Fruit Laboratory, addressed the Students' Agricultural Club of Fresno State College on the subject, "Biological Control of Noxious Plants through the Agency of Insects," and recounted experiences incidental to this work in Mexico, Australia, and the United States.

On May 3 J. C. Hamlin was asked to act as consulting entomologist at a meeting of California packers of dried fruits, called to consider the present very heavy infestation of figs. The work of several species of insects was fully discussed, and Mr. Hamlin made recommendations for preventing similar loss in the future by certain variations of practice in the packing plants.

A "Dried Fruit Coordinating Committee" was recently formed, sponsored by the Dried Fruit Association of California and the University of California. J. C. Hamlin, in charge of the Bureau's dried fruit insect investigations at Fresno, has been asked to serve as a member of the subcommittee on entomological problems.

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#### BEE CULTURE INVESTIGATIONS

James I. Hambleton, Apiculturist, in Charge

Prof. L. M. Bertholf, of Western Maryland College, visited the Bee Culture Laboratory on May 2, and discussed plans preparatory to continuing during the summer his investigations on the light responses of the honeybee.

Members of the Pan American Conference on Standardization, meeting in the third Pan American Commercial Conference, visited on May 10 the exhibit and demonstration of the United States Standard Grades for honey, prepared by the Division of Bee Culture Investigations of the Bureau of Entomology. This work was shown in connection with the exhibit of the Bureau of Agricultural Economics in the new Standardization Building. Considerable interest was manifested in this exhibit as a means of facilitating export and import trade in honey, and as a basis for international standardization, as the standard honey graders used in this work are now located in Berlin and London, as well as in the export ports of the United States, and are also in use in New Zealand.

Recent visitors to the Bee Culture laboratory included W. Herrod-Hempshall, Technical Advisor in Beekeeping, British Ministry of Agriculture; Prof. Dr. Hans Nachtsheim, of Germany; Dr. L. J. Cole, Secretary of the National Research Council; Prof. E. F. Phillips, of Cornell University; and Dr. S. B. Fracker, of Madison, Wis.

Miss Catherine Lucas, of England, has completed her investigation at the Bee Culture Laboratory, conducted in connection with her study of the amoebae of insects.

### TAXONOMIC INVESTIGATIONS

S. A. Rohwer, Senior Entomologist, in Charge

H. F. Schwarz, of the American Museum of Natural History, spent three days, May 2, 3, and 4, in the Division of Insects studying the collection of meliponid bees, comparing specimens with types, and making notes in preparation for a trip abroad which he is expecting to take in July, when he will do further studying in various museums in Europe.

Dr. Karl Jordan, curator of the Tring Museum, England, spent most of the month of May at the National Museum, studying the National Collection of fleas. Dr. Jordan is preparing a monograph of the fleas of the world as a memorial to the late Honorable N. Charles Rothschild, who was for many years an associate of Dr. Jordan in his work on the fleas. While in Washington Dr. Jordan called on a number of scientific men whose acquaintance he had made abroad.

While at the Museum Dr. Jordan gave to the National Collection a male of Arixenia jacobsonii Burr from the Malay Peninsula, a very interesting and rare insect belonging to the order Dermaptera.

Prof. H. C. Fall, of Tyngsboro, Mass., visited the Division of Insects from May 24 to May 27, studying types in the Casey Collection of Coleoptera.

Frank Johnson, of New York, recently spent a day in the Section looking at the Lepidoptera collection, and brought with him some very nice contributions to it.

T. H. Hubbell, of the Zoological Museum, University of Michigan, visited A. N. Caudell on May 27, studying material of the genus Ceuthophilus.

Dr. J. M. Aldrich, of the Division of Insects, left Washington by automobile on May 29 for a three months' trip, collecting insects in the West. Dr. Aldrich has been collecting Diptera of the United States since 1890, and has in mind several regions in the West where but little collecting has been done. One of these is in eastern Nevada, in the East Humboldt Range. This is a long distance from the places where insects have been extensively collected, and some slight collections made there have shown a surprising number of undescribed species. This will be the principal objective of Dr. Aldrich's trip. Second in importance are the Black Hills of South Dakota, which on account of remoteness from through lines of railroad and the principal automobile routes have also been but little investigated as far as the Diptera are concerned. Dr. Aldrich spent three weeks in the Black Hills in 1892 and collected some material which is now in the National Collection. Practically no other Diptera from that region are now in the Museum. Besides the two points mentioned, Dr. Aldrich will collect in many other interesting places, including the continental divide in Colorado, the vicinity of Lake Tahoe, Mono Lake, and the high Sierras. Dr. Aldrich is accompanied on the trip by Mrs. Aldrich and his niece, Miss Mary Foley, Assistant Scientific Illustrator in the Division of Truck-Crop Insect Investigations.

One of the early amateur entomologists of Washington was Henry F. Schoenborn, 1833-1896. He was an active collector of butterflies and moths from the 60's to the 80's of the last century. His collection after his death was taken care of by his children, and has now been donated to the National Museum. It is in good condition, and is especially rich in local material from the neighborhood of the District of Columbia. It also contains many European species and other material of value.

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Mabel Colcord, Librarian

NEW BOOKS

Aircraft Yearbook 1927. Aeronautical Chamber of Commerce of America, New York, 1927. P. 67-99, Governmental aviation. (P. 91-95, Bureau of Entomology.)

Armbruster, Ludwig.

Imkerische Honigprüfung. Hft. 1-3. Karl Wachholtz, Neumünster in Holstein, 1926. (Anleitung für Bienenzüchter, hrsg. von Ludwig Armbruster.)

Bailey, H. A. and Trought, T.

The Development of the Egyptian Cotton Plant. 46 p., 2 pl. Government printing press, Cairo, 1926. (Egypt. Min. of Afr. Tech. & Sci. Service Bul. 60.)

Berro Aguilera, J. M.

El gusano de la frutas Ceratitis capitata Wied. 88 p. illus. Almeria, 1927. At head of title: Cuerpo nacional de ingenieros agronomicos. Estacion de patologia vegetal de Almeria.

Bishoff, H.

Biologie der Hymenopteren... 598 p., illus. Julius Springer, Linkstrasse 23, Berlin W 9, 1927. 25.50 marks. (Biologische Studienbücher, hrsg. von Walther Schoenischen, Berlin.)

Boone, C. and Boone-Wepster, J.

Mosquitoes of Surinam, a study of neotropical mosquitoes... 557 p., illus. de Bussy, Amsterdam, 1925. At head of title: Koninklijke vereniging het koloniaal instituut te Amsterdam. Mededeelingen No. XXI - Afdeeling Tropische Hygiene No. 13.

Brooks, C. E. P.

Climate Through the Ages. 439 p., illus. Ernest Benn, limited, 8 Bouverie Street, London E. C. 4, 1926. 15 shillings. References at ends of chapters.

Campbell, D. H.

An Outline of Plant Geography. 392 p., illus. The Macmillan Co., 60 5th Ave., New York, 1926.

Christophers, S. R., Sinton, J. A., and Covell, G.

Synoptic tables for the identification of the anopheline mosquitoes of India. 23 p., plates. Central Publications Branch, Calcutta, India, 1927. (Central Malaria Bureau Health Bul. 10.)

Cole, F. R.

A study of the terminal abdominal structures of male Diptera (two-winged flies). P. 397-499, illus. (California Acad. Science Proc. ser. 4, v. 16, No. 14, April 27, 1927.)

Coupin, H. E. V.

L'amateur des coléoptères, guide pour la chasse, la préparation et la conservation. 364 p., illus. J. B. Baillièvre et fils, 19 rue Hautefeuille, Paris, 1926. 12 francs. (Half-title: Bibliothèque des connaissances utiles.)

Dakin, W. J.

The Elements of General Zoology; a guide to the study of animal biology. 496 p. Oxford University Press, 35 W. 32d Street, New York, 1927. 12 shillings, 6d, net. "Affords an excellent outline for those teachers desiring to change the usual course in general zoology into a more physiological one." (Science, May 20, 1927, p. 501.)

Donisthorpe, H. St. J. K.

British ants: their life history and classification. Ed. 2, rev. and enl. 436 p. Geo. Routledge & sons, Ltd., Broadway House, 68-74 Carter Lane, Ludgate Hill, E. C. 4, London, 1927. 25 shillings. Bibliography, p. 407-427.

Deutsche zentral-Afrika-Expedition, 2d, 1910-1911.

Ergebnisse. Unter Führung Adolf Friedrichs..... bd. 1, lfg. 1-18, illus., plates. Klinkhardt u. Biermann, Leipzig, 1913-1925. Bd. 1. Zoologie, hrsg. von Dr. H. Schubotz.

Ewers, H. H.

The Ant People. Translated by Clifton Harby Levy. 323 p., illus. Dodd, Mead & Company, 4th Ave. and 30th Street, New York, 1927. \$3.00.

Fraser, Samuel.

American fruits, their propagation, cultivation, harvesting and distribution. 892 p., illus. Orange Judd Co., 15 E. 26th Street, New York, 1927. \$4.50.

Herfs, Adolf.

Ökologische Untersuchungen an Pediculoides ventricosus (Newp.) Berl. 67 p., plate. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 1926. 21 Marks. Schriftenverzeichnis, p. 63-67.

Hingston, R. W. G.

A naturalist in Himalaya. 300 p., illus. Witherby & Co., 326 High Holborn, W. C. 1, London, 1920. 6 shillings, 3d, Many observations on ants, spiders, butterflies and moths.

Hustache, Alphonse.

Synopsis des curculionides de Madagascar. 583 p. Tananarive, 1924. (Academie Malgache, Bulletin, new series, v. 7.)

International Congress of Entomology, 3d, Zurich, 1925.

Verhandlungen des III Internationalen Entomologen-Kongresses, Zurich, 19-25 Juli, 1925, hrsg. von K. Jordan und W. Horn. Bd. 1-2. G. Ushmann, Weimar, August, 1926. \$9.00.

Lacroix, Adrien, and Ragot, C. L.

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